Case Report

Strangulation of the Small Intestine Secondary to Meckel’s Diverticulitis: Report of a Case in Old Age

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A 90-year-old Japanese male was referred to our hospital with severe abdominal pain and vomiting. A diagnosis of strangulation of the small intestine was made, and emergency surgery was performed. Intraoperative exploration revealed that a loop of small intestine was strangulated in an opening formed by adhesion of the thickened tip of a Meckel’s diverticulum to the mesentery of the small intestine. Pathological examination confirmed severe chronic inflammation at the tip of the Meckel’s diverticulum. In the classification by Rutherford and Akers this type of strangulation is included in a rare group of intestinal obstructions following inflammation of Meckel’s diverticulum.

Key Words: Meckel’s diverticulum, acute abdomen, strangulation of the small intestine

Introduction

Meckel’s diverticulum, an omphalomesenteric remnant, is the most common congenital abnormality of the small intestine11. The embryologic and pathologic features were first described in 1808 by Meckel12, and the generally accepted incidence of Meckel’s diverticulum in the general population according to the literature is approximately 2%3-10. The natural history of Meckel’s diverticulum was investigated by Soltero and Bill13, and although they calculated that there was an approximately 4% likelihood of causing complications in the patient’s lifetime, the rate of complications decreased to zero in old age. Complications include bleeding, intussusception, inflammation, perforation, volvulus, strangulation, and neoplasia.

We report a rare case of strangulation of the small intestine caused by Meckel’s diverticulitis in a 90-year-old Japanese male that was successfully treated by emergency operation. This case suggested that intestinal strangulation caused by Meckel’s diverticulitis should be included in the differential diagnosis of patients with acute abdomen, even in old age.

Case Report

A 90-year-old Japanese male was admitted with a 24-hr history of severe right upper quadrant abdominal pain and several episodes of nausea and vomiting. His past medical history was unremarkable. His most recent bowel movement has been 36-hr before admission. Physical examination of the abdomen revealed moderate distention, severe tenderness, and voluntary guarding. The laboratory data showed a leukocyte count of 18,900/mm³;
A diagnosis of strangulation of the small intestine was made, and emergency surgery was performed. Intraoperative exploration revealed strangulation of a loop of small intestine in the opening formed by adhesion of the thickened tip of a Meckel's diverticulum to the mesentery of the small intestine. The Meckel's diverticulum was located 50 cm proximal to the ileocecal junction and measured 7.5 × 4.0 × 3.5 cm (Fig. 3). A 40 cm length of small intestine extending from the last 10 cm of the terminal ileum to the neck of the Meckel's diverticulum was necrotic. The necrotic intestine, including the Meckel's diverticulum, was removed, and a primary end-to-end anastomosis was performed. Pathological examination confirmed severe chronic inflammation of the tip of the Meckel's diverticulum (Fig. 4). The postoperative course was uneventful, and the patient was discharged.

**Discussion**

A Meckel's diverticulum may give rise to a number of complications, including hemorrhage, inflammation, and obstruction.\(^1,3-14\). Bleeding is the most dangerous complication of Meckel's diverticulum, and is common in children. The most common cause of bleeding is ulceration of the small bowel by acid produced by ectopic gastric mucosa in the
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Fig. 4 Microscopic examination of the Meckel's diverticulum revealed severe chronic inflammation of the full thickness of the Meckel's diverticulum, especially at the tip of the diverticulum (HE, ×10).

diverticulum. Obstruction, however, is the most common complication in adults. Aarnio and Salonen studied abdominal complication of 71 Meckel's diverticula and found that males predominated with a male to female ratio of 2:1. Complications of Meckel's diverticulum were most frequent in the 10- to 25-year-old group, while 10% of the patients were over 60 years, and the rate decreased to zero in old age. Of the 35% of the patients who were symptomatic because of abdominal complications, 32% had intestinal occlusion.

The mechanisms by which Meckel's diverticulum can produce intestinal obstruction have been analyzed by Rutherford and Akers and they classified them as follows: group 1, volvulus around a vitellomumbilical cord; group 2, intussusception; group 3, strangulation by a mesodiverticular band; group 4, Littre's hernia; and group 5, obstruction secondary to inflammation. The pathological examination and intraoperative findings in our patient suggested that strangulation of a loop of small intestine was caused by adhesion of the tip of the Meckel's diverticulum to the mesentry of the small intestine secondary to inflammation of the Meckel's diverticulum, suggesting that the present case belongs to group 5 in Rutherford's classification and is a rare type of obstruction.

Although the diagnosis of strangulation in our case was made preoperatively based on the abdominal CT findings, the diagnosis of Meckel's diverticulum was made intraoperatively. Preoperative diagnosis of Meckel's diverticulum has been reported to be difficult, and it was found to have been made in only 34 of 600 patients (5.7%), mainly by 99m Tc-pertechnetate radionuclide scans. Although all symptomatic Meckel's diverticula should be resected, the surgical treatment of asymptomatic Meckel's diverticula is still a matter of controversy. Meckel's diverticulum was found in 55 (1.5%) of 3758 patients during appendectomy, Meckel's diverticula discovered as incidental findings can be resected safely with a low complication rate, regardless of the patient's age, suggesting that exploration for a Meckel's diverticulum should be performed during every laparotomy and that every Meckel's diverticulum should be removed to prevent the severe complications, such as occurred our patient.

Laparoscopic examination and treatment has been recommended for several complications of Meckel's diverticulum, such as bleeding, obstruction, and inflammation. The use of a laparoscope for initial abdominal exploration can help differentiate Meckel's diverticulum from more common causes of such disorders, and when the diagnosis of a complication of Meckel's diverticulum is made, the diseased segment can be resected of through the scope or through a small incision. Most of those laparoscopic operations have been elective surgeries for bleeding as a complication after the diagnosis of Meckel's diverticulum by a 99mTc-pertechnetate radionuclide scan. Emergency laparoscopy-assisted surgery, however, may be suitable for patients with strangulation as a complication.

In conclusion, we have reported a case of a rare type of strangulation secondary to Meckel's diverticulitis. Intestinal strangulation secondary to Meckel's diverticulitis should be included in the
differential diagnosis of acute abdomen, even in old age.

References


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